

CLAIMS:

1. ^A A display device comprising a ^{C B} cathode ray tube, a ^B deflection unit and a ^D display screen, the cathode ray tube including an in-line electron gun comprising

- a main lens portion for generating a main lens field

- a pre-focusing lens portion which, viewed in the direction of travel of the electron beams, comprises a first, a second and a third electrode for generating a pre-focusing lens field, wherein the electrodes are provided with apertures for transmitting the electron beam, and

- the deflection unit is arranged to deflect the electron beam across the display screen, characterized in that the electron gun comprises means for generating an auxiliary lens field between the pre-focusing lens field and the main lens field, whereby (in operation, the intensity of the auxiliary lens field causes the electron beam to leave the main lens substantially parallel to the in-line plane) the diameter of the electron beam at a gap of the main lens at the anode side being smaller than or substantially equal to the diameter of an aperture of the second electrode throughout the deflection of the electron beam across the display screen.

2. A display device as claimed in claim 1, characterized in that the means for generating an auxiliary lens field are adapted to generate a first quadrupole field in the main lens portion and a second quadrupole field in the prefocusing lens portion.

3. A display device as claimed in claim 1, characterized in that the means for generating the prefocusing ^{lens} field and the second quadrupole field are constructed such that, in operation, only one prefocusing lens and two quadrupole fields for building up the second quadrupole field, are generated in the prefocusing lens portion.

4. A display device as claimed in claim 3, characterized in that the in-line electron gun further comprises a fourth electrode, a fifth electrode a sixth electrode, and a seventh electrode, which electrodes have apertures for transmitting electron beams, and in

Functional Limitation

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that the display device comprises means for applying the static voltage to the third, the fifth and the seventh electrodes.

5. A display device as claimed in claim 1, characterized in that the means for generating an auxiliary lens field are adapted to generate an astigmatic lens field in the main lens portion, whereby the intensity of the astigmatic lens field in the direction perpendicular to the in-line plane is stronger than the intensity of the astigmatic lens field in the in-line plane.
- 10 6. A display device as claimed in claim 5, characterized in that the means for generating an auxiliary lens field are adapted to generate an astigmatic lens field in the prefocusing lens portion, whereby the intensity of the astigmatic lens field in the direction perpendicular to the in-line plane is stronger than the intensity of the astigmatic lens field in the in-line plane.
- 15 7. A display device as claimed in claim 5 characterized in that viewed in the direction of travel of the electron beams, the in-line electron gun further comprises a fourth electrode, a fifth electrode a sixth electrode, and a seventh electrode, which electrodes have apertures for transmitting electron beams, and in that the display device comprises means for applying a first static voltage to the second and fourth electrode, a second static voltage to the third and fifth electrodes and a third static voltage to the sixth electrode.
- 20 8. A cathode ray tube (for use in a display device) as claimed in the one of the preceding claims.